IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re of Application of: Masahiro Kawano		§	
Conf. No.:	9762	§	Group Art Unit: 2852
Appln. No.:	10/718,314	§	Examiner: Sophia S. Chen
Filing Date:	November 20, 2003	§	Attorney Docket No.: 9448-148US (G0303US)

Title: Image Forming Apparatus With A Current Measuring Section

AMENDMENT ACCOMPANYING RCE

This Amendment and Remarks is in response to the Office Action mailed on October 3, 2005 and the Advisory Action mailed on February 16, 2006. A Petition for a Three Month Extension of Time is filed herewith. This Amendment accompanies a Request for Continued Examination (RCE) under 37 C.F.R § 1.114.

Please amend the application, without prejudice, as follows:

Amendments to and Listing of the Claims:

This listing of claims replaces all prior versions and listings of claims in this application. Please amend claims 1, 4, 6-7 and 9-10, wherein strikethrough and double brackets indicates a deletion and underlining indicates additions, and add new claims 11-16, as follows:

1. (Currently Amended) An image forming apparatus[[,]] comprising:

a photoconductive body on which an electrostatic latent image can be formed;

a developing member that causes developer to adhere to the electrostatic latent image to develop the electrostatic latent image;

a developer-supplying member that supplies the developer to said developing member;

a current measuring section that measures a current flowing through said developing member, the current being measured in timed relation with the development of the electrostatic latent image; and

a voltage-setting section that sets said developer-supplying member to a corresponding one of first voltages, the corresponding one of first voltages being set in accordance with the current ~~in timed relation with development of the electrostatic latent image~~.

2. (Previously Presented) The apparatus according to Claim 1, wherein said current measuring section measures the current in at least one of a non-image forming mode where the electrostatic latent image is not formed on said photoconductive body and a solid-image forming mode where a solid electrostatic latent image is formed on a substantially entire surface of said photoconductive body.

3. (Cancelled)

4. (Currently Amended) An image forming apparatus[[,]] comprising:

a photoconductive body on which an electrostatic latent image can be formed;

a developing member that causes developer to adhere to the electrostatic latent image to develop the electrostatic latent image;

a developer-supplying member that supplies the developer to said developing member;

a current measuring section that measures a current flowing through at least one of said developing member and said developer-supplying member; and

a voltage-setting section that sets at least one of said developing member and said developer-supplying member to a corresponding one of first voltages, ~~the first voltages being set in timed relation with development of the electrostatic latent image~~ the corresponding one of the first voltages being set in accordance with the current,

wherein said current measuring section measures the current both in a non-image forming mode where the electrostatic latent image is not formed on said photoconductive body and a solid-image forming mode where a solid electrostatic latent image is formed on a substantially entire surface of said photoconductive body, the current being measured in timed relation with the development of the electrostatic latent image.

5. (Cancelled)

6. (Currently Amended) The apparatus according to Claim 4, wherein said ~~voltage setting~~ voltage-setting section sets the corresponding one of the first voltages based on a difference in the current between the non-image forming mode and the solid-image forming mode.

7. (Currently Amended) The apparatus according to Claim 10,

wherein the current is ~~a current flowing through said developing member and is~~ measured in ~~the~~ a non-image forming mode; and

wherein when the current is larger than a predetermined value, said ~~voltage setting~~ voltage-setting section increases an absolute value of the voltage supplied to said charging member by a predetermined first value.

8. (Cancelled)

9. (Currently Amended) The apparatus according to Claim 10,

wherein ~~said current measuring section measures a first current that flows through said developing member and a second current that flows through said developer-supplying member, the first current and the second~~ the current ~~being~~ is measured in ~~the~~ a non-image forming mode; and

wherein when the current is larger than a predetermined value, said ~~voltage setting~~ voltage-setting section either increases an absolute value of the voltage supplied to said charging member by a predetermined first value or decreases by a predetermined second value an absolute value of ~~a corresponding one of voltages~~ the voltage supplied to said ~~developing member and said~~ developer-supplying member.

10. (Currently Amended) An image forming apparatus[[,]] comprising:

a photoconductive body including a surface on which an electrostatic latent image is formed;

a charging member that charges the surface of said photoconductive body;

a developing member that causes developer to adhere to the electrostatic latent image to develop the electrostatic latent image;

a developer-supplying member that supplies the developer to said developing member;

a current measuring section that measures a current flowing through ~~at least one of said developing member and~~ said developer-supplying member; and

a voltage-setting section that sets said charging member to a voltage in accordance with the current.

11. (New) An image forming apparatus comprising:

a photoconductive body including a surface on which an electrostatic latent image is formed;

a charging member that charges the surface of said photoconductive body;

a developing member that causes developer to adhere to the electrostatic latent image to develop the electrostatic latent image;

a developer-supplying member that supplies the developer to said developing member;

a current measuring section that measures a current flowing through said developing member, the current being measured in timed relation with the development of the electrostatic latent image only when the electrostatic latent image has a reference pattern; and

a voltage-setting section that sets said charging member to a voltage in accordance with the current.

12. (New) The apparatus according to Claim 11,

wherein the current is measured in a non-image forming mode; and

wherein when the current is larger than a predetermined value, said voltage-setting section increases an absolute value of the voltage supplied to said charging member by a predetermined first value.

13. (New) The apparatus according to Claim 11,

wherein the current is measured in a non-image forming mode; and

wherein when the current is larger than a predetermined value, said voltage-setting section either increases an absolute value of the voltage supplied to said charging member by a predetermined first value or decreases by a predetermined second value an absolute value of the voltage supplied to said developing member.

14. (New) An image forming apparatus comprising:

a photoconductive body including a surface on which an electrostatic latent image is formed;

a charging member that charges the surface of said photoconductive body;

a developing member that causes developer to adhere to the electrostatic latent image to develop the electrostatic latent image;

a developer-supplying member that supplies the developer to said developing member;

a current measuring section that measures a current flowing through at least one of said developing member and said developer-supplying member, the current being measured in timed relation with the development of the electrostatic latent image only when the electrostatic latent image has a reference pattern; and

a voltage-setting section that sets said charging member to a voltage in accordance with the current.

15. (New) The apparatus according to Claim 14,

wherein the current is a current flowing through said developing member and is measured in a non-image forming mode; and

wherein when the current is larger than a predetermined value, said voltage-setting section increases an absolute value of the voltage supplied to said charging member by a predetermined first value.

16. (New) The apparatus according to Claim 14,

wherein said current measuring section measures at least one of a first current that flows through said developing member and a second current that flows through said developer-supplying member, the first current and the second current being measured in a non-image forming mode; and

wherein when at least one of the first current and the second current is larger than a predetermined value, said voltage-setting section either increases an absolute value of the voltage supplied to said charging member by a predetermined first value or decreases by a predetermined second value an absolute value of the voltage supplied to said developing member.

REMARKS

Claims 1-2, 4, 6-7 and 9-16 are pending and active in this application. A Request for Continued Examination under 37 C.F.R. § 1.114 is submitted herewith.

Claims 1 and 4 were amended to more particularly point out and distinctly claim the present invention. Claims 11-16 were added to further define the present invention. Claim 6 was amended to correct a minor informality. Claims 7 and 9 were amended to correct minor informalities and to further define the present invention. Claim 10 was amended to further define the present invention. Claims 3, 5 and 8 were previously cancelled.

No new matter was added as a result of this Amendment. All of the language in the new claims is explicitly or inherently supported by the original specification. The new language in claims 1 and 4 wherein "the current [is] measured in timed relation with the development of the electrostatic latent image" is supported by at least page 12, line 29 through page 12, line 5. The SB current is a current that flows through the toner-supplying roller 3. The language of new independent claims 11 and 14 which indicates that "the current being measured in timed relation with the development of the electrostatic latent image only when the electrostatic latent image has a reference pattern" is supported by at least page 12, lines 30-33.

For at least the reasons set forth below, withdrawal of all outstanding rejections as they may relate to the amended claims and the new claims is respectfully requested.

Telephone Interview

Applicant's undersigned representative wishes to thank the Examiner for the courtesy of the telephone interview on February 15, 2006. Applicant has since revised new claims 11 and 14 (from the form in which they were presented during the interview) in the present Amendment as set forth above.

Request for Interview Prior to Formal Action on Amendment

Applicant requests an interview prior to formal action on this response. An "Applicant Initiated Interview Request Form" accompanies this response. Please contact Applicant's undersigned representative to schedule the interview.

Claim Objections

Claims 6, 7 and 9 were amended to correct minor informalities cited by the Examiner. Withdrawal of the claim objections is respectively requested.

Rejection under 35 U.S.C. § 102(b)

Claim 10 was rejected under 35 U.S.C. § 102(b) as being anticipated by Umeno (JP 2000-206766 A), hereinafter "Umeno."

Patentability of claim 10 over Umeno

Claim 10 now includes the same limitation that is believed to be at least one reason for the patentability of claim 1, and which was previously considered by the Examiner, namely, a current measuring section that measures a current flowing through a developer-supply member.

Amended claim 10 recites, in part,

> a current measuring section that measures a current flowing through said developer-supplying member....

Umeno does not disclose or suggest a current measuring section that measures a current flowing through a developer-supply member. The Abstract and Figs. 1 and 2 of Umeno disclose a current measuring section that measures only a current flowing through a developing roller 8, which is not a developer-supplying member.

In contrast to Umeno, a preferred embodiment of the present invention discloses the above-highlighted limitation. See Fig. 2 and page 7, lines 3-16 of the current specification which

clearly disclose a current measuring section 28 that measures a current flowing through a toner-supplying roller 3 (i.e., developer-supplying member).

Nor does Kishimoto (JP 07-271139) make up for this deficiency in Umemo. Kishimoto discloses a developing current detecting means 80 that detects the current that flows through a developing sleeve 21 (which corresponds to the developing roller 2 of the present invention). Nowhere does Kishimoto disclose or suggest detecting the current that flows through an element such as a developer-supplying member of the present invention (e.g., developer-supplying member 3 shown in Fig. 9). In fact, Kishimoto does not disclose any element that corresponds to a developer-supplying member of the present invention.

In order to anticipate a claim, the reference must teach each and every element of the claim, and "the identical invention must be shown *in as complete detail* as is contained in ... the claim." MPEP § 2131.

It is therefore, respectfully submitted, that independent claim 10 is not anticipated by Umeno because Umeno does not disclose or suggest each and every element of independent claim 10, as amended. Accordingly, Applicant respectfully requests that the rejection of independent claim 10 under 35 U.S.C. § 102(b) should be withdrawn.

New Claims

Patentability of new independent claims 11 and 14 over Umeno

New independent claims 11 and 14 each recite, *inter alia*:

> the current being measured in timed relation with the development of the electrostatic latent image only when the electrostatic latent image has a reference pattern....

None of the cited references, including Umemo and Kishimoto, discloses or suggests a voltage-setting section that sets the charging member to a voltage in accordance with a current flowing through the developing member wherein the current is measured in timed relation with the development of the electrostatic latent image *only when* the electrostatic latent image has a reference pattern.

As mentioned above, the Abstract and Figs. 1 and 2 of Umeno merely disclose a current measuring section that measures only a current flowing through a developing roller in order to calculate the charge potential of the toner-image carrier.

Kishimoto is directed to maintaining the development current at a constant value for improving development performance. For example, Kishimoto discloses that maintaining the development current at a constant value will prevent the development performance from deteriorating. See paragraph [0029]. In Figs. 1-8 and 19, Kishimoto apparently detects development current every time an image is formed and developed regardless of the type of image. Kishimoto does not form an image of a specific pattern.

It is therefore, respectfully submitted, that new independent claims 11 and 14 are patentable over Umeno and/or Kushimoto. Claims 12-13 and 15-16 depend from claims 11 and 14, respectively, and are therefore patentable for at least the reasons cited above.

Allowable Subject Matter

The Examiner has stated that claims 1, 2 and 4 are allowed. In addition, the Examiner indicated that claim 6 is allowable over the prior art, but objectionable for the reason stated above. Claim 6 was amended to correct a minor informality and is now in condition for allowance, therefore the objection to claim 6 should be withdrawn. Further, claims 7 and 9 were objected to as being dependent on a rejected base claim (claim 10), but were found allowable if placed into independent form. Since claim 10 has been shown to be allowable over the cited prior art, claims 7 and 9 are also allowable.

CONCLUSION

Insofar as the Examiner's rejections were fully addressed, the instant application including claims 1-2, 4, 6-7 and 9-16, is in condition for allowance. Issuance of a Notice of Allowability of all pending claims is therefore earnestly solicited.

Respectfully submitted,

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(Date)

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